

IN THE CLAIMS:

Please CANCEL claims 21-24 without prejudice to or disclaimer of the recited subject matter.

Please AMEND claim 7, as follows. For the Examiner's convenience, all claims currently pending in this application have been reproduced below:

1. (Original) A projection exposure apparatus, comprising:

an illumination optical system for illuminating a pattern formed on a first object, with light;

a projection optical system for projecting the pattern of the first object, illuminated by said illumination optical system, onto a second object for exposure of the same with the pattern;

a main system including said illumination optical system and said projection optical system; and

an interferometer for use in measurement of an optical characteristic of said projection optical system and being mounted on said main system.

2. (Original) An apparatus according to Claim 1, wherein said interferometer includes a detection optical system for observing a light beam from one of the first and second objects, said detection optical system being disposed outside an exposure light flux of said projection optical system in an exposure process and being moved onto a light path of said projection optical system in a process for measurement of wavefront aberration of said projection optical system.

3. (Original) An apparatus according to Claim 1, further comprising first and second light sources, wherein said first light source is used with said illumination optical system for illuminance of the pattern, and wherein said second light source is used with said interferometer.

4. (Original) An apparatus according to Claim 3, wherein said interferometer is operable to perform measurement with respect to plural points within an exposure region of said projection optical system.

5. (Original) An apparatus according to Claim 4, wherein an aberration characteristic of said projection optical system within the exposure region is detected on the basis of measurements made with respect to said plural points.

6. (Original) An apparatus according to Claim 5, wherein a curvature of image field of said projection optical system is measured on the basis of measurements made with respect to said plural points.

7. (Currently Amended) An apparatus according to Claim 6, wherein the curvature of image ~~field~~ field of said projection optical system is detected on the basis of (i) a coordinate position of said detection optical system of said interferometer with respect to an optical axis direction, upon measurements of a wavefront with respect to said plural points, (ii) the wavefront as measured by said interferometer, and (iii) a coordinate position of a spherical surface mirror,

provided in said interferometer, with respect to the optical axis direction of said projection optical system.

8. (Original) An apparatus according to Claim 5, wherein light from said projection optical system is reflected by one of a flat mirror and a wafer.

9. (Original) A system according to Claim 5, wherein distortion of said projection optical system is measured on the basis of measurements made with respect to said plural points.

10. (Original) An apparatus according to Claim 9, wherein the distortion of said projection optical system is detected on the basis of (i) a coordinate position of said detection optical system of said interferometer with respect to an optical axis direction, upon measurements of a wavefront with respect to said plural points, (ii) the wavefront as measured by said interferometer, and (iii) a coordinate position of a spherical surface mirror, provided in said interferometer, with respect to the optical axis direction of said projection optical system.

11. (Original) An apparatus according to Claim 1, wherein said interferometer is disposed on a side of said projection optical system, facing to the first object.

12. (Original) An apparatus according to Claim 11, wherein said interferometer includes a spherical surface mirror disposed adjacent to an image plane which is on one side of said projection optical system facing to the second object.

13. (Original) An apparatus according to Claim 12, wherein said spherical surface mirror is mounted on a stage for the second object, being provided in said main system.

14. (Original) An apparatus according to Claim 13, wherein said spherical surface mirror is made movable along an optical axis direction of said projection optical system, through moving means being provided for focus adjustment of said projection optical system within said main system.

15. (Original) An apparatus according to Claim 14, further comprising a detection optical system having a TTR alignment scope with an objective lens, being mounted on said main system.

16. (Original) An apparatus according to Claim 1, wherein said interferometer is disposed on one side of said projection optical system, facing to the second object.

17. (Original) An apparatus according to Claim 16, wherein said interferometer includes a spherical surface mirror disposed adjacent to an image plane on one side of said projection optical system facing to the first object.

18. (Original) An apparatus according to Claim 1, wherein said interferometer comprises a Fizeau type interferometer.

19. (Original) An apparatus according to Claim 1, wherein said interferometer comprises
a Twyman-Green type interferometer.

20. (Original) An apparatus according to Claim 1, wherein said interferometer comprises
a radial shear type interferometer.

21-24. (Cancelled)